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## Persistent Infection of Calves with Bovine Viral Diarrhea Virus on U.S. Beef Cow-calf Operations

The U.S. Department of Agriculture's National Animal Health Monitoring System conducted the Beef 2007–08 study, which focused on beef cow-calf health and management practices in 24 States divided into three regions. These major beef cow-calf producing States represented 79.6 percent of U.S. operations with beef cows and 87.8 percent of U.S. beef cows.

One of the goals of the Beef 2007–08 study was to estimate the prevalence of calves persistently infected with bovine viral diarrhea virus (BVDV) on U.S. beef cow-calf operations.

Infection with BVDV can affect an animal's reproductive efficiency and cause a variety of conditions, including respiratory and digestive disease.

Ultimately, bovine fetuses are the source of persistent infection with BVDV in cattle. Fetuses exposed to the virus between 40 and 120 days of gestation can become immunotolerant to BVDV and shed the virus their entire lives. These persistently infected animals can pass the virus to noninfected cattle, which develop clinical disease. If these newly-infected animals are pregnant, they can pass the infection to their calves (if the exposure occurs at the right stage of gestation) thereby creating the next generation of persistently infected calves. Infection with BVDV results in other effects at other stages of gestation. Vaccination can increase resistance to BVDV infection and thus lower the frequency of persistently infected calves. However, vaccination is not always effective in eliminating the risk of persistently infected calves. Herd BVDV control plans use surveillance, biosecurity, and biocontainment strategies to prevent, reduce, and eliminate BVDV. Appropriate testing, targeted vaccination, and management are integral parts of these plans.

### \* States/Regions

**West:** California, Colorado, Idaho, Montana, New Mexico, Oregon, Wyoming

**Central:** Iowa, Kansas, Missouri, Nebraska, North Dakota, South Dakota

**Southeast:** Oklahoma, Texas, Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Tennessee, Virginia

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### Testing calf crop for BVDV

During the Beef 2007–08 study, beef producers who expected to calve at least 70 percent of their cows and heifers from November 1, 2007, through June 30, 2008, were encouraged to collect ear notches from their entire 2008 calf crop. Ear notches were subsequently frozen dry until tested for indications of persistent infection with BVDV.

At the laboratory, notches were tested using an IDEXX antigen capture enzyme-linked immunosorbent assay test according to the manufacturer's instructions.

Overall, 205 operations collected ear notches from calves born between November 2007 and June 2008. The number of notches collected per operation ranged from 3 to more than 500. A total of 44,150 notches were collected and tested.

The prevalence of BVDV among the tested notches was 0.12 percent (53/44,150). Within herds, the prevalence ranged from 0 to 16.0 percent.

Of the 205 operations that submitted ear notches, 18 had 1 or more positive samples, for a herd-level prevalence of 8.8 percent. Ten operations had only one positive sample (1 operation with 1 to 49 cows and 9 operations with 200 or more cows), and 1 operation with 200 or more cows had 10 positive samples. The percentages of positive operations were similar across herd sizes (table 1) and regions (table 2) due to the large variability in the estimates.

**Table 1. Operations with Samples Positive for BVDV, by Herd Size:**

	Herd Size (Number of Beef Cows)				All Operations
	1-49	50-99	100-199	200 or More	
Operations submitting samples	27	37	56	85	205
Operations with positive samples	1	0	6	11	18
Percent operations with positive samples	3.7	0.0	10.7	12.9	8.8



**Table 2. Operations with Samples Positive for BVDV, by Region:**

	Region		
	West	Central	Southeast
Operations submitting samples	73	88	44
Operations with positive samples	11.0	4.5	13.6
Percent operations with positive samples	8	4	6

BVDV prevalence was similar across calf-age categories (table 3).

**Table 3. Percentage of Calves Positive for BVDV, by Age of Calves:**

Percent Calves			
Age			
Less Than 3 Weeks	3 Weeks to 3 Months	Over 3 Months	Age Unknown
0.14 (8/5,635)	0.13 (37/29,228)	0.14 (6/4,424)	.04 (2/4,863)

## Summary

The low prevalence of persistent infection with BVDV in beef calves found in the Beef 2007–08 study is consistent with findings from other studies. Despite the low prevalence at the animal level, approximately 1 of 12 operations had at least 1 persistently infected calf, suggesting that a number of operations likely have BVDV circulating in their herds. Producers should work with their veterinarian to determine the likelihood that their herd has an animal persistently infected with BVDV and, if warranted, develop a surveillance strategy to determine the BVDV status of their cattle. If persistently infected animals are discovered, a control or elimination plan would be advisable, based on the operation's specific situation.

For more information on BVDV, visit the following Web sites:

[www.bvdinfo.org](http://www.bvdinfo.org)  
[www.avc-beef.org](http://www.avc-beef.org)  
[www.aabp.org](http://www.aabp.org)



For more information, contact:

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 2150 Centre Avenue  
 Fort Collins, CO 80526-8117  
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<http://nahms.aphis.usda.gov>

#551.0609

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